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ABSTRACT

As educational researchers continue to discover and appreciate the merits of a qualitative approach, interest in classroom discourse as a useful interpretive resource for making sense of teaching and learning has grown tremendously, especially the use of transcripts. The principal purpose of this paper is to demonstrate that the primary benefit of using transcripts is that it brings students back to classroom affairs as participants undertaking classroom discourse rather than as theoretical renderings of underlying systems. The issue of transcripts is discussed with regard to educational research and two analytic traditions, process-product research and a sociolinguistic approach, from which educational research into classroom discourse emerged. Transcript as theory and transcript as record are considered, and two exhibits are provided as examples. (Contains 54 references.) (ASK)

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Classroom Discourse as an Analytic Resource for Educational Research? Transcripts as a Record of Talk-in-Interaction

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Transcripts as a Record of Talk-in-Interaction

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Introduction

As educational researchers continue to discover and appreciate the merits of a qualitative approach, interest in classroom discourse as a useful interpretive resource for making sense of teaching and learning has grown tremendously (Cazden, 1986; Edwards & Westgate, 1994). In particular, the use of transcripts (Edwards & Lampert, 1993; Green, Franquiz & Dixon, 1997; Mischler, 1991; Ochs, 1979; Psathas & Anderson, 1990; Roberts, 1997; West, 1996) has flourished in the analysis of classroom discourse. While recognizing this burgeoning reliance on transcripts in educational research, our principal purpose in this paper is to demonstrate that the primary benefit of using transcript is that it brings us back to classroom affairs as participants' undertaking, rather than as theoretical renderings of underlying systems behind classroom discourse.

Transcripts and everyday life

Before delving into the use of transcripts in the educational literature, we wish to point out that the transcription is not limited to the realm of academics. In daily life, 'what people say' is constantly available to others for verbatim reporting. Sometimes, this reproduced discourse yields far-reaching consequences, creating public spectacles such as President Clinton's recent infamous testimony, or the transcripts from myriad glamorous witnesses who testified during the O. J. Simpson trial. Transcripts of other occasions --airplane "black box" recordings, or 9-1-1 tapes, for example – serve various practical purposes as accounts, evidence, demonstration, training, or even entertainment.

Overwhelmingly, though, reproducing "what people say" is a mundane interactional practice we routinely produce as a part of, for instance, talk around the dinner table, or shoptalk, or even 'chitchat.' As a matter of fact, this practice of reproducing what others says is an important way in which we carry out ordinary daily affairs. In itself, the very act of reproducing, for example, is often heard as doing some recognizable actions: showing acknowledgement, complaining about another's attitude, making accusations, or crafting humor.

When we reproduce what others say in communication, we expect that it is sensible and intelligible to those with whom we are communicating. In other words, the availability of transcripts or verbatim reports in natural talk-in-interaction suggests the presence of an interpretive competence between members to an interaction, which we constantly invoke and rely on from each other. It is through members'[1] interpretive competence that the use of verbatim is made available as intelligible and thus meaningful in face-to-face interaction.

Transcripts in educational research

In many respects, interactional competence is a fundamental and permeating feature of classroom life, as the bulk of classroom tasks are carried out through direct

[1] We wish to point out that we use the term "members" throughout this document to be synonymous with "parties to a particular interaction."

interaction among teacher and students. Unlike vernacular and everyday uses of verbatim descriptions, however, the use of transcripts for the study of classroom discourse is heavily indebted to the formal analytic treatment with a different degree of theoretical attachments. As language phenomena became the objects of academic treatment, the study of classroom talk centers on uncovering the systematic, reproducible, and recurrent properties of language which hold across a multitude of different occasions. Perhaps, the reason for this treatment is that educational research on classroom discourse has evolved through the combination of an array of analytic methods and theoretical assumptions developed elsewhere in such fields as linguistics (e.g., Sinclair & Coulthard, 1975), sociology (e.g., Mehan, 1979), psychology (Chomsky, 1965) and/or ethnography of speaking (e.g., Cazden, John & Hymes, 1972). The upshot of the formal treatment of classroom talk is this: the use of transcripts is affiliated to, and thus influenced by, disciplinary conventions as to how to choose and interpret a data set.

The alternative presented in this paper, however, is a consideration of how *the vernacular analysis of the parties to the talk* could be the primary focus of classroom discourse analysis. Thus, the transcript becomes a record of members' interpretive action, bringing into view their analysis of what goes on as the interaction unfolds in temporal sequence. Given the rapid proliferation of qualitative research and its primacy of interpretation, this premise with regard to transcription is not new in educational research. However, we claim that there is a discernable difference in how language phenomena are treated in the alternative program, which we believe would lead to quite a different understanding of classroom interaction.

In the following section, we give a preliminary formulation of how classroom discourse has been treated in educational research. Rather than listing all of the research findings that have accumulated over the years, the literature review examines the theoretical assumptions and implied methodological approaches which have influenced the major analytic programs into classroom discourse and use of transcripts. We then present an alternative possibility for research on classroom interactions, and provide exhibits such analysis from two different classroom interactions.

Two Analytic Traditions

Historically, educational research into classroom discourse has emerged from two different analytic traditions: process-product research and a sociolinguistic approach (Cazden, 1986; Wilkins, 1982). The two are distinct in their assumptions, goals, and methodological imperatives.

Process-product research

The primary goal of process-product research (e.g., Doyle, 1977; Dunkin & Biddle, 1974) is to find ways to record classroom practices through talk analysis. In this approach, the features of classroom discourse are coded into categorical constructs with a view to measuring learning outcomes or the effectiveness of given teaching practices. Perhaps the best-known example of this type of research is the system created by Flanders (1970), but there have been numerous subsequent category classification systems developed (see Evertson & Green (1986) for a comprehensive review). Numerous categorized sets of classroom talk, thus, are seen to reveal teachers' behavioral characteristics, their effectiveness, or other areas of interest to the researchers (Evertson

& Green, 1986). In other words, the functions and roles of language utterances are viewed in reference to the analytic goals and theoretical principles that guide methodological procedures.

In the language education literature, for example, the characteristics of classroom discourse are used to identify behavioral characteristics of effective teachers (Fanselow, 1977; Jarvis, 1968) or to measure the degree to which the given utterances reflect communicative ways of language use (Johnson, 1995). In science education, classroom discourse has been investigated to determine the degree of fit between students' language and the language of professional science (Tapper, 1999; Yerrick, 1998). Discourse in science education is unproblematically used to get at students' understanding of scientific concepts.

Sociolinguistic approaches

The sociolinguistic study of classroom discourse can be characterized by a more descriptive or interpretive emphasis. Though various and even incongruous research agendas, analytic methodologies, and philosophical assumptions have developed within this approach (McKay & Hornberger, 1996), sociolinguistic inquiry into classroom discourse originated in a practical concern with children's language and its relation to school success in U.S (Cazden et. al, 1972; Hymes, 1972). The most prominent analytic program which has been instrumental for this educational endeavor was the ethnography of speaking (Gumperz & Hymes, 1972; Hymes, 1962). In this view, the primary objective of analysis is to describe the way in which language is drawn from the realities of speech contexts, thus recognizing that the social environment of a particular language performance is constitutive of language forms:

> A new approach was needed, one which would take the organization of speech itself as an object of study, and consider the meanings and abilities associated with speaking in particular communities (Hymes, 1992, p. 32).

What this means is that any linguistic utterance which occurs during the course of social interaction inevitably refers to and acts on behalf of the very features of the circumstances: the characteristics of speech contexts, the identity of the speaker and listener, beliefs and norms of social groups represented, and the occasioned character of the interaction. In this analytic practice, language becomes the representational medium that attests to the substance of cultural systems and social categories (Lee, 1991).

Hence, the principal analytic goal in looking into classroom discourse was to describe how it is that different social categories and cultural norms are manifest in ways of speaking in the classroom and, how they are associated with teaching practices and learning outcomes. For example, many researchers have investigated classroom participation structures (e.g., Erickson & Mohatt, 1982; Mehan, 1979; Philips, 1983) because they manifest the degree of fluency of the participants in reference to the normative ways of speaking in the classroom (who can say what, when, and to whom). In other cases, identified patterns of speech are ascribed to the particular identities of students and teachers, the properties of classroom contexts, and/or communicative goals. That is to say, patterns of classroom discourse are considered to indicates differences with regard to believes, values, reference groups, norms and the like of different speech

communities (Hymes, 1972). Therefore, the realities of classroom discourse become a place where the relevant speech communities or social groups that each speaker belongs to, exhibit their identities through different ways of speaking and rules of use. This perspective on the sociability of language is well-summarized in the preface to Lemke's book on science classroom discourse (Lemke, 1990):

> Because communication and teaching are social processes, they depend on attitudes, values, and social interest, not just on knowledge and skills. In every chapter of this book, we will have to look at conflicts of interests and values in order to understand the successes and failures of communication in the science classroom. The classroom is not isolated from the attitudes, values, and social interests of the larger community. Teachers and students bring these with them into the classroom. Science education itself tries to teach certain values, and those values may not always agree with students' values or with students' views about their own interests (p. xi).

Because the actual details of language use are characterized in reference to such external constructs, these underlying cultural categories and social realities are treated as "givens," identifiable and thus perspicuous to the eyes of analysts who bring with them well-defined theoretical parameters and methodologies.

Gumperz's *conversational inference* (Gumperz, 1981; 1982) furnishes a good example of this binary paring between language patterns and underlying cultural constructs. *Conversational inference* refers to the situated process by which participants in a conversation assess other participants' intentions and on which they base their responses. In the course of action, the members' *conversational inference* allows them to recognize and use linguistic signals which are contextually dependent and also culturally determined within and across speech communities. Through the exchange of linguistic signals, participants to classroom interaction make sense of each other, predict the course of action, and make out communicative intentions.

While Gumperz's *conversational inference* attempts to explain the cognitive processes involved in the exchange of linguistic signals, it reveals an analytic tendency to treat social realities as substantiated entities that are represented by particular language patterns. Meaning-making is seen as a matter of identifying and utilizing those social "substances" that are reified in different linguistic signals. These substances of social worlds include participant identities, norms of speaking, communicative goals, perspectives or beliefs, contextual features and other relevant extra-linguistic elements and they are pulled into view by linguistic signals that members come to discover in the course of action.

In this process, language is often treated as secondary to the workings of these social categories which are viewed to determine the way that communication is performed (Watson, 1992). Competent speakers consciously or unconsciously recognize this interdependence of culture and language forms, and bring about that knowledge of rules of speaking in their communicative actions. This theoretical rendering of interrelation of language and culture is not irrelevant to the late-booming literature of critical discourse, whereby the identities of language-speakers are located in the

landscape of power, gender, knowledge, beliefs, cultural affiliations, etc. For example, social groups and their power relations feature prominently in critical analyses of classroom discourse (e.g., Anderson, 1989; Gabriel & Smithson, 1990; Manke, 1997). From a sociolinguistic perspective, it is the work of *conversational inference* that enables parties to an interaction to recognize and realize such social relations through interactional exchange of linguistic signals. Accordingly, analysts are advised to look behind the organization of language in order to find the way in which different social categories and cultural patterns shape and enter into the constitutive features of classroom discourse.

Transcript as Theory?

As the advent and proliferation of sociolinguistic approaches to discourse analysis has opened up diverse norms and methodological possibilities for the study of classroom talk, the use of transcripts has exploded in educational research (Cazden, 1986). Yet, the presence of multiple analytic strands and theoretical derivatives seems to preclude the possibility of a neutral or unified view on the use of transcript in education research because:

> Transcribing is a political act that reflects a discipline's conventions as well as a researcher's conceptualization of a phenomenon, purposes for the research, theories guiding the data collection and analysis, and programmatic goals (Green et. al, 1997, p. 172).
>
> Transcriptions of speech reflexively document and affirm theoretical positions about relations between language and meaning. Different transcripts are constructions of different worlds, each designed to fit our particular theoretical assumptions and to allow us to explore their implications (Mishler, 1991, p. 271).

As early as 1979, Ochs illustrated how it is that different forms of transcript can be sources of bias derived from researchers' theoretical agendas (Ochs, 1979). Any given transcript can be viewed as one possibility out of an infinite array of alternatives, the choice of which represents a particular disciplinary interest and its conventions (e.g., Jefferson, 1984; Du Bois, 1991). For example, Mishler has shown how the same segment of talk can be differently transcribed to serve the particular research agendas two different analysts bring into their studies (Mishler, 1991). While some suggestions are available on methods of transcribing (Cazden, 1988; Edwards & Lampert, 1993; Ochs, 1979; Psathas & Anderson, 1990; West, 1996), all of these authors caution that one's theoretical position and research question shape, if not determine, the way that transcripts get produced. Accordingly, there is inherent analytic dilemma for those who use transcribed data in their research. On the one hand, any transcript is saturated with the distinctive theoretical positions and research tradition of the given field; on the other hand, analysts are obliged to produce readable and thus recognizable transcripts for other readers in the field.

While acknowledging the significance of theoretical affiliation in the use of transcript, we might also recognize that the preoccupation with such external constructs

colors the way we must think of the analysis. Primarily, those constructs could impose themselves on the way in which language interactions are viewed and analyzed, rather than treating such interactions on its their terms as the product of members' interpretive action. In other words, this preoccupation with the political loci that a given transcript represents stands in the way of and thus takes for granted that *it is the members to an interaction who accomplish communication*--that they display what they know, attend to how meaning is constructed, project their analysis of what goes on and make their analysis available to each other (Schegloff, 1997).

At the outset of this paper, we noted that talk-in-interaction reproduced as verbatim reports or transcripts is a mundane, ordinary exercise in the social world and it is members' interactional competence that makes any communicative events possible. What others say to us becomes intelligible not because natural language is a self-sufficient entity that contains social facts and cultural forms. Nor would the intelligibility of language come from the interrelation of contextual properties and social categories as underlying determinants of meaning-making. Rather, natural language becomes intelligible *in and as* members' making of discourse as they recognize, react to, and act on what is embodied and realized in the course of action. This is what we assume by suggesting that we as analysts attend to the interactional details of a discourse interaction we wish to study.

We do not deny the presence of social variables such as social identities, aspects of surrounding contexts, or communicative goals and intentions as possible and constitutive of classroom discourse. Yet, we claim that participants' undertaking of such properties should come before relying on any theoretical renderings. In other words, workings of those properties have to be shown (and they can be shown) analytically if we follow closely how members construct a very ordered and evident world for each other as competent analysts themselves. To sum, we contend that there is much to be learned from lay renderings of 'what people say' and the use of transcript enables us as analysts to enter into the members' making of their classroom affairs.

Transcript as Record

This alternative reading of the nature of transcripts recommends familiarity with ethnomethodology and conversation analysis of social action (Garfinkel, 1967; Heritage, 1984; Lynch, 1993; Sacks, 1992) whose principal initiative was meant to urge us to return to social affairs themselves as *members'* undertakings. Rather than relying on theoretical contemplation to grasp and then to render corresponding cultural variable and social categories behind language use, this alternative analysis takes it that meaning-making is a constructive exercise between members who are producing visibly evident worlds for each other. Understanding, therefore, is not a matter of 'cracking a code' in which participants recognize and realize the corresponding relation between language and the social world as pre-established agreement (Heritage, 1984). Rather, it is a constructive process in which the staggering array of vicissitudes and contingencies of language become managed as the members organize their talk for another, evoking and thus reconstituting a certain set of features of the interlocutors and/or the context in the very course of talk-in-interaction (Schegloff, 1987). The use of transcript opens up the analytic possibility that the members' complicated interpretive actions are pulled into

view because transcripts as a record of people's actions display what is said, where and when it was said, what was being accomplished by saying it, in light of what possible considerations and in virtue of what motives it was said (Heritage, 1984). For example, note the following remark made by a mother (A) to her five-year-old daughter (B):

A: Brynn, what did I tell you when adults are talking?
B: (silence)
C: OK, well...

Following a sociolinguistic analytic framework, one could immediately recognize that A is "doing reproach" to B. This recognition comes through identifying the relevant social categories at work: the social identities of the participants (a mom, her kid, and a second adult), and/or features of underlying cultural contexts (interruption). These recognized social categories become analytic resources through which sociolinguistically-oriented analysts educe the appropriate ways of speaking for the occasion that the participants of the identified social categories are to follow. Some analysts of critical discourse may stretch this scenario into landscape of the gender or adult-child power relations in their account of reproach in this context.

None of these analysis, however, shows how the talk "Brynn, what did I tell you when adults are talking?" accomplishes the recognizable action, "doing reproach"—this is completely taken for granted. In other words, what is missing in sociolinguistic analysis is that it is the methodic practices of the speaker A which make her utterance hearable and available as a reproach. Furthermore, it is the interpretive actions by B and C who recognize and display their understanding of how A has accomplished her action.

First, we notice that *'Brynn, what did I tell you when adults are talking?'* was produced as a question. In contrast to a statement, a question such as, *'what did I tell you...?'* obliges the recipient of the question -- in this case, Brynn — to produce a relevant response. This particular question, *'what did I tell you...?'*, refers back to certain past events that are known to and thus shared by A and Brynn. That is to say, it is a question of accountability for a circle of members (Macbeth, 1998), such as family or classmates, who were there and remember what happened 'last time'. This interactional history shared by A and Brynn, therefore, becomes a ground for A's reproach: *we have already talked about this, and you should have known this.*

Second, *'...when adults are talking'* is a formulation of what Brynn did in the previous turn and of course, what these two people, A and C were doing at the moment. What Brynn did could have been characterized in different ways: asking a question, or complaining, for example. By the same token, what A and C were doing could be characterized in various ways: chatting, discussing or meeting. Yet, what Brynn did was formulated *in reference to who these two other persons are and what they are doing at the moment*. Note that these two other persons are characterized as 'adults' and that furnishes a ground upon which A has instructed how B's identity is to be heard. That is to say, by invoking the category of 'adults,' A implicates what identity she wants Brynn to assume and thus, what kind of role she is expected to play (i.e., children are not supposed to interrupt adults' conversation). This category 'adults', however, is very different from the social categories that are used as interpretive resources by the sociolinguists. First, it

is the category of the members to an interaction, which is situationally invoked and locally assembled in the course of action (for a discussion of membership categorization device, see Sacks, 1972; Hester & Eglin, 1997). Thus, the adequate sense of 'what adults are' and how it is relevant is made available, not because the participants had prior agreement as to what kinds of identities they are to take, but because of A's methodic use of the categories 'adults' whose meaning is constituted and thus reflexive to the features of the context.

That is to say, the remark *'Brynn, what did I tell you when adults are talking'* becomes a reproach, not because of some inherent semantic properties that contain propositional information about adequate ways of speaking as pre-established tableau. Even recognizing the relevant social categories of the participants or contextual surroundings would not warrant such a hearing[2]. Instead, *'Brynn, what did I tell you when adults are talking'* is heard as a reproach because the speaker in the scene makes it hearable through her methods of talking: she formulates what was done in the previous turn, elicits relevant features of social identity, and instructs where to locate the basis for reproach. Moreover, A's work of reproaching entirely relies on Brynn's competence to hear it that way. Brynn's silence in the next turn thus displays her understanding of how A's remark is constructed as 'reproach' and it is an agreement to practical actions that A's remark is seen to carry out; evoking who A and C are, what they are doing, who she (Brynn) is under the context, and what she is expected to do.

Talk-in-interaction itself is constitutive of what people are doing, whether they are making complaints, doing reproach, or any of countless other affairs, since such talk displays members' distinctive methods and particular strategies for: exhibiting their interpretive work, assembling relevant variables, and organizing their talk to produce contextually relevant actions. Thus, to do "analysis of language" is to do analysis of the active production of social actions by the members to the interactional occasion (Watson, 1992) and the transcript is a primary resource that allow us to see such undertakings.

Two exhibits

It has been noted in the previous section that classroom discourse reproduced as transcript opens up the analytic possibility of showing the member's treatment of classroom affairs as their undertaking, not of its analysts' insistence (Schegloff, 1997). The classroom is a unique social space with distinctive ways of speaking and interactional tasks. Yet, the sense making classroom interaction is no less contingent and no less exigent than that of natural conversation: teacher and students are constantly challenged to react to contingent matters, to display their understanding of each and every turn, to find problems and repair them. Within these practices, one can see some version of members' sensitivity to the particularity of each occasion and their interactional fluency becoming constitutive of the classroom events that they are part of.

Although transcripts can not recover all relevant facets of classroom interaction, they can furnish us with a record of the member's analysis of the temporal organization of the talk. Rather than treating context as a stable background, the present analysis presents transcribed exchange of the talk between a teacher and her students in order to show the

[2] Although these social categories of participants or contextual surroundings evoke possible actions that could have happened. Yet, note that they are 'possible' relevant features, not the event themselves.

local determination of sense making as meaning of language utterances are contingent upon and tied to the previous turns at speaking (Levinson, 1983; Schegloff & Sacks, 1973). This tie between sentences is a hallmark of member's interpretive actions through which they adapt and manage an unforeseen range of divergent language phenomena. The following section, thus, offers two examples of such alternative treatment of transcript through a brief analysis of scenes from two undergraduate classrooms.

Finding the question

The first scene is from an undergraduate ESL (English as a Second Language) classroom interaction, reproduced as a transcript.

E1085896: ESL Composition

1. T: What- what did you learn about Eastern Kentu- Kentucky from reading the
2. story, and these argument essays, what- (0.7) what is Eastern Kentucky like?
3. W: Mounta//in
4. S3: //Mountains
5. T: OK, mountains are there ?(0.7)
6. T: //What else?
7. W: //Poor-
8. (1.0)
9. W: Poor people
10. T: Very poor people, (2.0) can you recall talking about this with you before (.),
11. what do we call that area?
12. S: Subculture,
13. T: Oh, it's ah sub-culture, what do we call the are- area geographically?
14. (1.0)
15. S: Rural?
16. T: ((Bending over to S))
17. S: Rural,
18. T: Rural, well, we can have rural area all over the world (.) what's that part of
19. America called?=
20. S: =( )
21. W: //Reservation?
22. T: No, that's what the Indians used to live.
23. S: ( )
24. T: What?
25. S: (//)
26. J: //((laughter))
27. T: Hear her, Youngsook, you're right behind her, wha:ja, wha-ja, which appendix
28. was that? (6.0) Turn to page one oh fi:ve, I have had you do this before, I
29. know I am not dreaming this, (2.5) Appala:chia, (2.0) Appalachia, (2.5) OK,
30. trust me it's very very interesting part of the world.

Punctions note intonations and associated pauses[3]:

//	overlap speech
=	the ending of one utterance and the beginning of a next without gap or overlap
[	Simultaneous start
(( ))	describing actions
( )	unidentifiable speech
(2.5)	silence and lapse of time in seconds
-	Cut off

The transcript shows a series of questions and answers between a teacher and her students. Although an enormous amount of research in the educational literature has been directed at teacher's questions (Cazden, 1986; Ellis, 1994; Evertson & Green, 1986), most analytic endeavors have centered on categorizing teacher questions as a measurement of effectiveness of teaching and/or learning outcome.

The following analysis, however, looks into the sequential organization of the talk as the locus of members' analytic interpretation: members manage their speakership, display their understanding of each other and thus carry out the classroom tasks. For example, the data exhibits the classic three-turn sequence as a familiar classroom turn-taking organization, namely, an IRE sequence (IRE: Initiation - Response - Evaluation) (Cazden, 1988; Mehan, 1979). Before treating IRE structures as being emblematic of any underlying constructs, the present analysis notes that IRE displays the distinctive analytic work done by the teacher and the students. Primarily, each successive turn in IRE indicates how the speaker of the turn hears the previous turn(s) at talk. For instance, student's response to the teacher's question displays the student's analytic work as to how s/he hears the teacher's question. By the same token, the teacher's third turn (evaluation) displays how the teacher interprets the student's response.

For instance, the student's answer in line 3, '*mountain*' is a response to the teacher's question in line 1-2 and thus displays how this student, W, understands the teacher's question. Subsequently, teacher's remark in line 5 '*OK, mountains are there*' shows how the teacher treats the student's answer in reference to her question in line 1-2. That is to say, the meaning-making in the classroom discourse is managed through a turn-by-turn process in which the shape and fate of utterances largely depends on and enters into the immediate interpretive actions of the members.

Thus, the properties of the teacher's first question in line 2, *'what is Eastern Kentucky like,'* are to be made out by looking into the student's next answer -- *'mountains'* in line 3-4. Note how the teacher organizes her answer in line 5. While she repeats the answer (*'mountains are there'*), she is inviting further response by means of producing slight gap at the end of the turn and of additional solicitation *'what else?'*. Then, we find:

9. W: Poor people
10. T: Very poor people. (2.0) can you recall talking about this with you before (.),
11. what do we call that area?
12. S: Subculture.

[3] The notation system follows the convention developed by Sacks, Schegloff & Jefferson (1974).

Here, the teacher's remark is seen to play two roles in IRE sequence: that of evaluation of the answer that was provided in the previous turn and that of initiation of new set IRE sequence as a new question. First as an evaluation, the teacher reformulates the answer *'poor people'* into *'very poor people'*. Reformulation may do several things in classroom discourse. Most especially, though, this teacher's reformulation furthers her questioning process in such a way that she reinforces the property of 'poor people' by injecting a qualifier 'very'. In other words, she is heard to build something and 'poor people' is part of it.

Second as an initiation, the teacher produces another question immediately. Whereas her previous question in line 1-2, *'what is Eastern Kentucky like?'*, was collecting any feature of Eastern Kentucky, like 'mountain' or 'poor people', the question 'what do we call that area?' is asking for a particular term for it. Structurally speaking, although multiple answers are possible to the previous question 'what is Eastern Kentucky like?', the question 'what do we call that area?' delimits range of possible answers into one.

Furthermore, this question comes with several interactional resources for students. First, the question *'can you recall...'* refers to past event(s) that are known to them and thus shows that the answer is already in the room waiting to be found. Second, given that the teacher is looking for categorical term by saying '*can you recall...*', then, the properties of the category are already out on the table: mountain and poor people. In other words, the teacher's remark in line 10-11 is the outcome of sustained analysis on the teacher's part as to how her previous question is heard by the students. Then, she organizes her utterances to furnish interactional resources for any next speaker who wants to answer.

By the same token, the subsequent answer *'subculture'* in line 12 demonstrates the student S's analytic work because the answer would not have been reasonable unless he observed closely how the previous exchange of question and answers led to particular kinds of interactional consequences and what this implications those had with regard to the answer that the teacher is looking for. That is to say, the answer 'subculture' represents interpretive action by the student S who examines the process in which the teacher instructs the students what to see to come up with the answer that she is looking for.

Then we find the next exchange:

13. T: Oh, it's ah sub-culture, what do we call the are- area geographically?
14. (1.0)
15. S: Rural

The teacher's remark in line 13 repeats the student S's answer again followed by another question. Note that line 13 is also the third evaluation position in IRE sequence in which the teacher displays how she hears the previous answer '*subculture*'. At the same time, it furnishes an important resource as it shows how the student S hears the teacher's previous question '*what do we call that area?*'.

The teacher's next question, 'what do we call the are-area geographically' is her analytic move to come up with the kind of answer that will elicit the right answer and the basis for this move is found in how the teacher hears '*sub-culture*'. In other words, the sense of *geographically* in *'what do we call that area geographically?'* is to display how

teacher makes the most of 'subculture' as she is providing more focused characterization of the category that she is looking for, by means of using compare and contrast: *'if subculture is academic term, what I am looking for is a geographic term'*. This is a distinctive categorical work that exhibits the teacher's analytic work to find the question that is to prompt students to come up with the right answer.

Given this analytic work by the teacher, the next answer *'rural'* in line 15 (and 17) is the outcome of student's interpretive analysis with regard to how the teacher has constructed her question and thus recognizing the teacher's interpretive work. This answer *'rural'* is, however, met by the following response by the teacher:

17. S: Rural,
18. T: Rural, well, we can have rural area all over the world (.) what's that part of
19. America called?=
20. S: =( )
21. W: //Reservation?

Once again, the teacher is using a comparative strategy and yet in a different way. First, she repeats the answer produced by the student. Then, she produces a remark '*we can have rural area all over the world*'. While it shows that 'rural' is not the answer she is looking for, the next remark '*we can have rural area all over the world*' displays rather explicitly how 'rural' is to be heard in reference to the answer that has yet to come. This becomes quite clear when we see the next utterance *'what's that part of America called?'* While this remark shows again the continuing analytic work on the teacher's part, we come to realize that the range of possible answers becomes narrowed down: something American.

The next answer *'reservation'* by student W, therefore, is the outcome of quite a sophisticated interpretive analysis given several previous exchanges of questions and answers. This analytic task includes monitoring closely the entire exchange of the talk in which the student collects all the information that is made available by several exchanges of question and answers: how each question led to what kind of answer, how each answer was taken up by the teacher for making the next question, and what kinds of category is implicated and pulled out etc. In other words, the answer *'reservation'* would have not been possible without looking into sequential environments of the talk in which the teacher and students display how they hear each other and what kinds of analytic resources are pulled into view in the subsequent turn; beginning from mountains, to subculture and rural area.

To sum, each and every question asked in this scene has an answer and yet, none of the exchanges can be treated independently of local sequential contexts. In other words, the sense of each question and answer is built upon the previous exchange where the teacher and her students display how they understand each other in relation to the interactional task underway. In this process, the teacher finds how each of her questions is analyzed by the student and uses that understanding to find the next question that serve her students better. In the meantime, an array of interactional resources are made available as the talk progresses, evoking shared interactional history, estimating the adequacy of the given answers, eliciting the common sense knowledge that the students might have, bringing in the categorical properties of the given answer and/or giving cues.

Because of this contingent nature of interaction, it would be misguided analytically to insist that a teacher's initial question was not an adequate one only because it did not promptly generate the right answer. In other words, the fact that the answer 'reservation' did not come out promptly can not be source of complaint against the indefinite and unspecified character of the question. Rather, the unspecified character of utterances furnishes the object of the members' analysis as they pull into view their sense making of each other, thus becomes object of our professional analysts. The transcript as a record of the member's interpretive action, allows us an access to these collaborative interactional works by the teacher and students as they carry out their classroom tasks.

Plastic or wood?

In science education, discourse analysis is gaining momentum as a resource for studying classroom interactions (Kelly & Chen, 1999). Yet, a preoccupation with the "big ideas" of science teaching and learning inevitably guides this analysis. For example, teacher talk has been judged for its authoritative portrayal of science (Carlsen, 1992), for its role in student oppression or empowerment (Lemke, 1990), and for its ability to re-direct student tasks and discourse (Yerrick, 1998). Additionally, talk in science classrooms has been studied for its indication of student science interests (Tunnicliffe & Reiss, 1999) or for its part in helping students and teachers construct scientific meanings (Candela, 1997; Kelly & Crawford, 1997). But careful analysis of discourse (in the way just demonstrated in reference to foreign language education) is not a common practice.

As an example of how it might be otherwise, we present two brief scenes from an undergraduate level physics laboratory course. We want to focus on an overlooked and taken-for-granted part of being a science student: following instructions. Although much effort is regularly put into developing science laboratory exercises and most certainly, care is taken in writing instructions for such exercises, it is routinely assumed that students will unproblematically be able to follow such instructions. After all, outside of the classroom, we follow instructions all of the time: for assembling a new toy, or for cooking a favorite dish, or for traveling to a vacation destination, for example. Yet I would suggest that being able to follow instructions as a practical matter is an interactional accomplishment worthy of researchers' attention. Amerine and Bilmes (1988) have demonstrated the interactional work involved when children follow directions for a science activity by describing the methods used by some elementary school students in completing simple physical science experiments. These researchers realized that an essential and unspoken curriculum in all classroom instruction was the work of following and enacting instructions. Yet the nature of all instructions is that they are hopelessly incomplete, owing to the indexical character of all accounts of the world. From an ethnomethodological perspective, children serve as an invaluable resource for studying how we learn to follow instructions, since "the child is incompetent in the ordinary, taken-for-granted skills of daily life...instructions and related explanations presuppose a range of competencies and conventional understandings, without which even the most detailed instructions are meaningless for organizing practical activities" (Amerine & Bilmes, 1988). Because undergraduate science students are competent at following instructions, however, their interactional achievement in doing so is routinely overlooked.

In the following scene, four students (A, B, C, and D) are completing a lab assignment on static electrical charge. In this segment, students A and B are getting ready to begin a portion of the activity in which they will be holding up different types of materials (glass rods, plastic rods, etc.) to some charged strips of cellophane tape which are suspended from a ringstand in front of them. Here are the students' instructions (reproduced from the lab manual) for this part if the activity:

> You have other objects at your lab table. Try rubbing some or these objects together (for example, a glass rod with silk or a plastic tube with wool) to see if after rubbing they have a "t-type" electric charge or "b-type" electric charge. List only those objects or types of materials that are clearly t-type or b-type.

The transcript below notes the interaction between A and B as they begin to follow those instructions. Students C and D are working on an unrelated project. The conventions used in this transcript are the same as those noted previously (Sacks et. al, 1974).

Physics132.9.30.98.
Plastic or wood?

1.	A: Therez: (0.5) a glass rod wi' silk	1.
2.	(1.0) plastic tube	2.
3.	B: w'got plastic tube ri' here	3.
4.	((B picks up white rod & black cloth))	4. C: On::e pop can
5.	A: or iz this the plastic tube?	5.
6.	((A reaches across B & picks up the black rod))	6.
7.	B: uhmm::	7.
8.	A: uh 'is iz:	8.
9.	((A hits rod on table two times))	9.
10.	A: *'ats plastic, i'nt it?* //	10.
11.	B: 'at soundz like wo:od	11.
12.	((B hits the other rod on the table three times))	12.
13.	A: ( ) *ben:ding* ( )	13.
14.	B: 'is iz woouhl right here	14.
15.	((B holds out the black cloth))	15. D: letz make sure they're charged
16.	A: *hmm:* ((A takes black cloth))	16. they seem ta die pretty fast
17.	A: *wuhl?* so:: (.) d'we have a- > > > >	17.
18.	d'y' have a glass rod over there?=	18.
19.	B: =glass rod ri' there	19.
20.	((A begins charging up the black rod with the black cloth))	20.

*****

We present this segment of transcript in order to illustrate the work involved in following instructions. This segment of transcript actually captures a mundane practice of science laboratory students; it's akin to "taking stock," and students routinely do this in preparation for performing an experiment. They identify relevant pieces of equipment in accordance with the instructions, and in doing so, they "fix" a field of view for gauging their scientific observations. These students quite seriously go about the business of determining the identities of the materials on the table in front of them. The transcript reproduces the talk, and some of the action, involved in this process. In this particular exercise, the students run into "trouble"-they notice two rods, either one of which could be a plastic rod. From the transcript we note that students A and B listen to the sound of the tubes hitting the lab table as one way of settling the trouble (lines 9-12). We can also note that they come up with different "hearings" of what the first rod (the black rod that A is holding) sounds like: 'plastic' and 'wood.' One of the students mentions 'bending' (line 13), which could provide a practical demarcation between plastic and wood (though it is not addressed further). The other student then mentions that he is holding a cloth which is wool: 'this is wool right here' (line 14).

Now, it may seem reasonable to a casual observer that one might listen to the sound of an unknown material as it collides with another object, or test its properties (for example, its rigidity) in order to determine its identity. But it is not immediately clear why identifying a scrap of wool would be relevant to this process. And, it's not apparent from the students' talk on the transcript whether the issue of "which rod is plastic" gets settled before 'wool' is mentioned, after 'wool' is mentioned, or indeed ever gets settled at all. In this case, the transcript points to other aspects of the interaction which may be implicated in the students' meaning-making during this exercise.

So, we may turn back to the videotape for assistance. And we may notice that, listening as competent speakers of the language ourselves, it doesn't "sound" like the issue was settled before 'wool' is mentioned. We may also want to again examine the instructions for this experiment. Recall that they state: "Try rubbing some or these objects together (for example, a glass rod with silk or a plastic tube with wool) to see if after rubbing they have a "t-type" electric charge or "b-type" electric charge." Here then is a possible answer to our question of the relevance of 'wool' to determining which rod is indeed 'plastic:' has the proximity of 'wool' and 'plastic' in the instructions somehow been matched with the proximity of 'wool' and 'plastic' on the table in front of the students? By mentioning in line 14 that he is holding 'wool' (which was sitting on the table with, and was picked up with the white tube), is student B "making the case" that he is the one holding the plastic tube?

Before we get too wrapped up in "what-if"s and "I think"s, we want to return to the point of using transcripts as records: they are records of the members' meaning-making, not the analysts'. And though we do not deny that our own interpretation is involved in analyzing the scene, transcribing the scene, or even hearing the scene, we want to hold ourselves to considering the members' meaning-making in our study and discussion of a particular scene. Further, in this example we can see how it is that transcripts are only a record that may point to the relevance of other items for members' meaning-making. For example, in the science lab students are interacting with materials and texts just as readily as with each other. As a result, analysis of a particular transcript is not always as straightforward as moving line-by-line through question-and-answer

sequences; students are handling materials and often also working with procedural instructions from a laboratory manual. In a sequence such as the one above, it can be worthwhile to consider what of the members' analysis is available from the videotape, or "scientific" equipment, or text materials being used by the students.

In line 17, student A takes the wool from student B. He says 'hmmmm. wool.' and then changes the subject, asking, 'so, do we have a glass rod over there?' (line 18). That's it; there is no more talk of the identity of the white and black tubes. If we were truly interested in how the students settle the issue, we may want to keep watching during the activity for how the results get recorded in their lab manuals: do they describe the tubes as plastic, wood, or maybe use another identifying feature, like color? But for our discussion today, we can note that it didn't seem to matter for the students, or for their purposes at hand at this point in time; apparently, they can—and do—carry on with their experiment without definitively settling the question of which rod is plastic. This, then, is the participants' enactment of their instructions as a practical matter.

We now turn to a second scene from the same physics classroom.

(Transcript in next page)

Later on during the same class period, the teaching assistant (T) has walked over to the table to "check in" with this lab group. She asks students C and D about their results:

In this segment, the parties' display of their understanding of the talk is more readily apparent. Here, we find a series of question-and-answer exchanges not unlike the IRE-structured teacher-student interaction from the language learning classroom scene examined earlier. The teaching assistant originally asks (line 100) 'so, what did you find out about the rods?' but then quickly narrows her question to be 'what type of charge are they?' (line 101). Student C produces an answer to this question in lines 102-103, and the teaching assistant asks about another material the students were to have tested, a blue styrofoam board (line 104). The first student hesitates in answering, and the second student volunteers an answer which the first student endorses (lines 105-107).

Notice that the teacher's query in line 108 gets repeated in line 110. In the course of ordinary interaction, repeating a segment of talk indicates to other parties present to the interaction that their understanding of what was asked is somehow in question. However, the students produce nearly the same answer to the teacher's questions (lines 109 & 111, 109 & 112), which produces a further source of trouble. The teacher finally indicates her understanding of the situation in line 113: what she has been calling the "black" rod, the students had classified as the "plastic" rod.

We also note that the interactional trouble encountered in lines 108-112 serves to turn the discourse in a new direction. Although the teacher tries to resume questioning the students about their results (line 114, 'ok, what about this one-the white one?'), the students now begin to question the teaching assistant about her classification of the rods (lines 115-124). Finally, the teacher tells her students, 'well, it doesn't matter; as far as you find them correctly, I'm not going to argue about the names' (lines 125-128).

Physics132.9.30.98. ***Argue about the names***

100. T: S' what did you find (.) about (.) the rodz?
101. What type of charge are they?
>
102. C: The: glass rod had- wa' was the tee (.) tape had da- had a like charge to that
103. like the plastic rod had a bee t- bee type charge
[
104. T: ( ) whad about the board? the blue board?
105. C: Uhhh: (1.5) blue boar:d
//
106. D: Didn' we say it had a bottom charge?=
/ \
107. C: =W'- Yeah it was the bottom (.) Same charge as the bottom
108. T: Okay did jyou try the bla::ck rod?
109. C: Yeah tha' was the plastic one
> >
110. T: Okay whad about the black one?
111. D: Thats the:- thats the plastic one
//
112. C: plastic plastic (rod)
// > > > >
113. T: oh the- oh thats what you call the pla-
114. T: ohkay whad about this one? (1.0) the white one?
//
115. D: ok what was that one?
116. C: Thats the-
[
117. D: Were these both suhposed tuh be glass rodts?
118. T: No this is thuh glass
119. D: Okay then what iz this one
/ \
120. T: I don' know (.) I call it black.
121. D, C, T: ((laugh))
122. C: I thought it was uh piece a plastic rod
[// //
123. D: A- we didnt have a spot for tha we thought it was sposed t'be the plastic rod
124. C: thats what it is (.) *piece a' plastic*
//
125. T: wehll it doeznt matter=
126. D: =uoh okay
127. T: as far as you find them correctly
128. D: ohkay
129. T: not going tuh argue aboud the names ((T. laughs))
*****

The indexicality of meaning takes on a life of its own in this example. Not only do indexical expressions such as 'this one' and 'that one' present interactional trouble for the parties to this conversation, the terms 'plastic' and 'black'-terms which might ordinarily be considered to have stable meanings-do, as well. This segment illustrates, as did the earlier segment from the L2 classroom, the work involved in common understanding. And here again, we can point out the difference between this type of analysis and a sociolinguistic-type of analysis of transcripts: we are trying to appreciate the work involved in common understanding, rather than stipulating such understanding as a premise for beginning an analysis. In this scene, we illustrate that coming to "common understanding" is work, even coming to common understanding about the identities (and relevance of the identities) of objects as simple and ordinary as plastic and glass tubes.

Instead of accepting that "common culture," or "theoretical truths" can settle and fix the meaning of words or objects—even everyday, ordinary ones—we argue that such meanings are "alive" and are only settled by members in the course of an interaction. And because coming to common understanding involves the participants' displays of meaning available to each other as competent language-users, they are on display and available to us as competent language-users as well, and they are available for transcription and study by professional analysis. It is somewhat ironic that the teaching assistant in line 129 says: 'I'm not going to argue about the names.' She and the students did, in reality, argue about the names of the materials used in the experiment, and it was precisely the work of arguing about the names that allowed them to come to common understanding. And by looking closely at interactions like this, we can see again the work involved in following instructions during a science activity. In lines 125 & 127 ('well, it doesn't matter, as long as you find them correctly'), the teaching assistant is most likely expressing the prevalent idea in science education that it is not the trivial details of laboratory instructions, but the Big Ideas of Science, which are important for students to know.

Perhaps the students in Scene 1 recognized this by never really determining which rod was "plastic." We saw, however, that when faced with the practical task of answering the TA's questions about the results of their experiment-about how they enacted their laboratory instructions-the names of the materials (the incidental details) did matter for the possibility of the achievement of communication. Likewise, the details of what goes on in classroom interaction could be of interest to professional studies of education, and transcripts as a record of such interaction assist us in this possibility.

Conclusion

One can relate patterns of classroom discourse to various facets of the social world conceptualized in the form of social values, community perspectives, common beliefs, cultural relevance, contextual features or the characters of students and teachers. In fact, the analysis of classroom discourse is saturated with a dependence on social categories and cultural systems as pre-given and unexplicated constructs that shape and motivate the analytic route of a given analysis. Thus, the meaning-making process in classroom discourse is treated as the outcome of interplay of well-demarcated underlying determinants that substantiate and reify the myriad ways of interactional practices. When interaction is viewed in this way, the use of transcribed material in analysis of language may become entangled with the issue of representation because particular transcribing

practices reflect the position that the analysts takes out of a welter of possibilities of attaching language phenomena to an infinite array of social categories. In this process, considerations of theoretical positions, analytic conventions, values and beliefs, subjectivism, etc. take over and stand in the way the very initiative that use of transcribed data furnishes us: participants' undertaking of their social world.

In other words, *classroom discourse reproduced as transcripts is a record of the members' interpretive work* as they display their understanding of what is said, how and by whom, under what sequential contexts – this should be recognized before any scholarly rendering of it. This is not to deny that the act of transcribing involves judgement on the part of the professional analysts. Nor is it to question the usefulness that different scholarship brings into the study of classroom discourse. Rather, it is simply to point out that the observation at the level of participants' casual and vernacular meaning-making manifests a sophisticated degree of methods of talk that deserves serious analytic consideration. Transcript is one tool that allows us to find the member's practiced handcraft in their world-makings.

The alternative analysis of classroom discourse we propose gives educational researchers a way to view classroom discourse as a situated achievement of the members as they methodically construct their classroom affairs. Emphasis on the details of interactional work therefore does not simply mean narrowing the analytic focus. Rather, it is done with the intent to retrieve the members' technical strategies as they weave through a multitude of possibilities and contingencies each interactional occasion generates.

The use of transcripts thus allows us to focus on classroom events themselves as self-organizing phenomena and to examine how the teacher and students cooperatively contribute to the organization of the given events. Instead of identifying certain variables and their relevance to the sociocultural backdrops, this analysis intends to demonstrate how an activity comes to identify itself as what it is and how members' affairs are accomplished, because it is through members' practices that questions find their answers and lap equipment become sensible to enable the students to carry out assigned tasks. Looking into detailed interactional organization can be profitable, as Schegloff has noted (Schegloff, 1997):

> Though it prompts impatience in those who aspire to more global claims and assertions, over and over again close examination of brief exchanges which may initially appear to casual inspection to be utterly unremarkable, or even transparently characterizable in vernacular or commonsense terms, turn out to yield rather complex, and different complexioned, understanding (p. 180)

It is through their sophisticated work of understanding that the members accomplish their ordinary classroom affairs, and that is what transcripts provide for us, analysts, to see.

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